

What is claimed is:

1. A method of controlling an automotive vehicle comprising:

determining a road roll rate;

determining a wheel departure angle in  
5 response to the road roll rate; and

controlling the vehicle in response to the wheel departure angle.

2. A method as recited in claim 1 further comprising determining a relative roll angle; and

10 wherein controlling the vehicle comprises controlling the vehicle in response road roll rate and a load-induced pitch misalignment.

3. A method as recited in claim 2 wherein determining a relative roll angle comprises determining  
15 a relative roll angle in response to a roll rate and a lateral acceleration.

4. A method as recited in claim 2 wherein determining a wheel departure angle comprises determining the wheel departure angle in response to the roll rate, the yaw rate, the road angular rate, the sensor yaw rate, the relative roll angle, the relative pitch angle, and the sensor pitch misalignment.

5. A method as recited in claim 4 wherein determining a road roll rate is performed when the relative roll angle is within a first predetermined threshold and the wheel departure angle is within a second predetermined threshold.

6. A method as recited in claim 5 wherein the first predetermined threshold and second predetermined threshold are a function of a roll gradient.

7. A method as recited in claim 1 wherein determining a road roll rate comprises determining the road roll rate in response to a sensor roll rate.

8. A method as recited in claim 1 wherein determining a road roll rate comprises determining the road roll rate in response to a roll rate and a yaw rate.

9. A method as recited in claim 1 wherein determining a road roll rate comprises determining the road roll rate in response to a roll rate, a yaw rate and a pitch rate.

10. A method as recited in claim 1 wherein determining a road roll rate comprises determining the road roll rate in response to a roll rate, a yaw rate and a pitch rate.

11. A method as recited in claim 1 wherein determining a road roll rate comprises determining the

road roll rate in response to a roll rate and a previous wheel departure angle.

12. A method as recited in claim 4 wherein determining a road roll rate comprises determining the road roll rate in response to a roll rate, a previous wheel departure angle and a time constant.

13. A method as recited in claim 4 wherein determining a road roll rate is performed in response to a wheel lift status.

10 14. A method as recited in claim 4 wherein determining a road roll rate is performed in response to a brake precharge status.

15 15. A method of controlling a safety system of an automotive vehicle comprising:  
determining a total roll angle velocity;  
determining a wheel departure angle in response to a total roll angle velocity;  
determining a relative roll angle; and  
controlling the safety system in response to the wheel departure angle and the relative roll angle.

16. A method as recited in claim 15 further comprising:  
determining a total roll angle velocity;  
determining a wheel departure angle in response to a total roll angle velocity;  
determining a relative roll angle; and

controlling the safety system in response to the wheel departure angle and the relative roll angle during wheel lift and for a predetermined time thereafter.

5           17. A method as recited in claim 15 wherein controlling the safety system comprises controlling at least one of an active brake control system, an active rear steering system, an active front steering system, an active anti-roll bar system, and an active suspension  
10 system.

          18. A method as recited in claim 15 wherein determining a total roll angle velocity is performed when the relative roll angle is within a first predetermined threshold and the wheel departure angle is  
15 within a second predetermined threshold.

          19. A method as recited in claim 18 wherein the first predetermined threshold and second predetermined threshold are a function of a roll gradient.

20           20. A method as recited in claim 15 wherein determining a total roll angle velocity comprises determining in response to a roll rate.

          21. A method as recited in claim 15 wherein determining a total roll angle velocity comprises  
25 determining in response to a roll rate and a yaw rate.

22. A method as recited in claim 15 wherein determining a total roll angle velocity comprises determining in response to a roll rate, a yaw rate and a pitch rate.

5           23. A method as recited in claim 15 wherein determining a total roll angle velocity comprises determining in response to a roll rate, a yaw rate and a pitch rate.

24. A method as recited in claim 15 wherein  
10 determining a total roll angle velocity comprises determining in response to a roll rate and a previous wheel departure angle.

25. A method as recited in claim 15 wherein determining a total roll angle velocity comprises  
15 determining in response to a roll rate, a previous wheel departure angle and a time constant.

26. A method as recited in claim 15 wherein determining a total roll angle velocity is performed in response to a wheel lift status.

20           27. A method as recited in claim 15 wherein determining a total roll angle velocity is performed in response to a brake precharge status.

28. A control system comprising:  
a roll rate sensor generating a roll rate  
25 signal;

a lateral acceleration sensor generating a lateral acceleration signal;

a yaw rate sensor generating a yaw rate signal; and

5 a controller coupled to the roll rate sensor, the lateral acceleration sensors, and the yaw rate sensor, said controller determining a total roll velocity total from the roll rate signal, the yaw rate signal and a pitch rate signal, said controller  
10 determining a relative roll angle from the roll rate signal and the lateral acceleration signal, said controller determining a wheel departure angle from the total roll velocity, said controller determining a calculated roll signal from the wheel departure angle  
15 and the relative roll angle signal.

29. A control system as recited in claim 28 further comprising a longitudinal acceleration sensor generating a longitudinal acceleration signal, said controller determining the total roll velocity as a  
20 function of the longitudinal acceleration signal.

30. A control system as recited in claim 29 wherein said controller determines a calculated pitch rate as a function of the longitudinal accelerator, said total roll velocity being a function of the calculated  
25 pitch rate.